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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/581,943	DUPARRE ET AL.	
	Examiner	Art Unit	
	JASON FLOHRE	4112	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *8/25/2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-41* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-41* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/25/2006 10/15/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 21 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The way in which the ratio of the active surface area of the detector to the active surface area of the microlens is adjustable is not disclosed in the specification and as such the invention cannot operate as intended without undue experimentation.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 2, 30 and 35-41 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "high" in claim 1 is a relative term which renders the claim indefinite. The term "sensitivity" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The sensitivity of the detector is therefore rendered indefinite.

The term "large" in claim 1 is a relative term which renders the claim indefinite. The term "pitch" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The pitch of the detector is therefore rendered indefinite.

The term "small" in claim 1 is a relative term which renders the claim indefinite. The term "active surface area" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The active surface area of the detector is therefore rendered indefinite.

The term "slightly" in claim 2 is a relative term which renders the claim indefinite. The term "central spacing or pitch" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The difference in central spacing or pitch of the microlenses compared to the detectors is therefore rendered indefinite.

The term "greater" in claim 30 is a relative term which renders the claim indefinite. The term "spacing" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The difference in spacing of a first plurality of pixels compared to the spacing of a second plurality of pixels is therefore rendered indefinite.

Regarding claims 36-41, the phrase "operable for" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claims 35-41 provide for the use of image recognition system according to claim 1, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 8, 11-13, 15, 19, and 27-29 are rejected under 35 U.S.C. 102(e) as being anticipated by Miyatake et al (United States Patent Application Publication 2006/0072029), hereinafter referenced as Miyatake.

Regarding claim 1, Miyatake discloses an image input device. Specifically Miyatake discloses an image input apparatus having microlens (1a) and light detecting

cells (3a), which has a grid-shaped partition wall (2) between them as disclosed at paragraph 39, lines 4-6 and exhibited in figure 1. Since all of the unit (consisting of a microlenses, light detecting cells, and partition walls) are arranged in a grid-like pattern, they each have a different relative location from the center of the side of the image recognition apparatus which faces the image. This difference in relative location causes each unit to have a different inclination for which a ratio of the field of view to the image field size can be determined, specifically. The table in paragraph 41 shows an embodiment which contains a 500 x 500 grid of pixels for a 10 x 10 grid of microlens. This teaches that each light detecting cell has a 5 x 5 pixel grid. The multiple pixels per cell teach a high sensitivity detector. The grid gives a pitch of 500 micron x 500 micron which is large. The active surface area would be smaller than if the cell contained a single pixel which had a much larger active area and is therefore considered small.

Regarding claim 2, Miyatake discloses everything claimed as applied above (see claim 1), in addition Miyatake discloses that a single object image can be obtained by rearranging the image information of a plurality of object reduced images focused on the prescribed region on the light detecting element by each of the said micro lens, which reads on “each optical channel detects at least on specific solid angle segment of the object space as corresponding image spot so that a totality of the transmitted image spots on the detector allows reconstruction of the object", as disclosed at paragraph 13, lines 5-8.

Regarding claim 8, Miyatake discloses everything claimed as applied above (see claim 1), in addition Miyatake discloses partition walls (2) which block light from

microlens other than the microlens it is situated under as exhibited in figure 2. The partition walls cause the optical channels to be free of off-axis aberrations for different inclinations of the optical axes.

Regarding claim 11, Miyatake discloses everything claimed as applied above (see claim 1), in addition Miyatake discloses that the number of microlens is 10 x 10 as disclosed at the table of paragraph 41. It was disclosed in above that each channel (unit) consists of 1 microlens. Therefore the number of optical channels is in the range of about 10 x 10 to 1000 x 1000.

Regarding claim 12, Miyatake discloses everything claimed as applied above (see claim 1), in addition Miyatake discloses the pitch of the microlens is 499 micron x 499 micron. This is the approximate size of the optical channel. The 499 micron x 499 micron size of the optical channels is in the range of about 10 micron x 10 micron to 1 mm x 1 mm.

Regarding claim 13, Miyatake discloses everything claimed as applied above (see claim 1), in addition Miyatake discloses that the regular arrangement of the optical channels are packed tightly in a square as exhibited in figure 1.

Regarding claim 15, Miyatake discloses everything claimed as applied above (see claim 1), in addition Miyatake discloses partition walls (2) which optically isolate the optical channels from each other as exhibited in figure 2.

Regarding claim 19, Miyatake discloses everything claimed as applied above (see claim 1), in addition Miyatake discloses that each channel comprises a detecting cell (3a) which have a plurality of regions, each of which detects a different color, which

reads on "the optical channels respectively have a plurality of detectors of one or more different functions", as disclosed at paragraph 109, lines 1-5 and exhibited in figure 12.

Regarding claim 27, Miyatake discloses everything claimed as applied above (see claim 1), in addition Miyatake discloses that each channel comprises a detecting cell (3a) which have a plurality of regions, each of which detects a different color (each region needs to consist of at least 1 pixel), which reads on “a plurality of pixels is assigned to each optical channel”, as disclosed at paragraph 109, lines 1-5 and exhibited in figure 12.

Regarding claim 28, Miyatake discloses everything claimed as applied above (see claim 27), in addition Miyatake discloses that each channel comprises a detecting cell (3a) which have a plurality of regions, each of which detects a different color (each region needs to consist of at least 1 pixel), which reads on “a plurality of pixels with different properties of groups of pixels with the same properties are present", as disclosed at paragraph 109, lines 1-5 and exhibited in figure 12.

Regarding claim 29, Miyatake discloses everything claimed as applied above (see claim 1), in addition Miyatake discloses that each channel comprises a detecting cell (3a) which have a plurality of regions, each of which detects a different color (each region needs to consist of at least 1 pixel and a color filter), which reads on “colour filters are disposed in front of a plurality of similar pixels”, as disclosed at paragraph 109, lines 1-5 and exhibited in figure 12.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3, 4, 9, 10 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyatake in view of Meyers (United States Patent 6,141,048), hereinafter referenced as Meyers.

Regarding claim 3, Miyatake discloses everything claimed as applied above (see claim 1), however Miyatake fails to disclose wherein a central spacing, or pitch, of the microlenses differs slightly from a pitch of the detectors in order to ensure a different inclination of the optical axes for the individual channels. However, the examiner maintains that it was well known in the art to provide wherein a central spacing, or pitch, of the microlenses differs slightly from a pitch of the detectors in order to ensure a different inclination of the optical axes for the individual channels, as taught by Meyers.

In a similar field of endeavor Meyers discloses a compact image capture device. In addition Meyers discloses that in order to see different fields of view the optical axis (214) of the lenslets (212) are located at a distance which becomes progressively larger than the center-to-center distance of the pixels in the array, as disclosed at column 5, lines 55-58, and exhibited in figure 5.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miyatake by specifically providing wherein a

central spacing, or pitch, of the microlenses differs slightly from a pitch of the detectors in order to ensure a different inclination of the optical axes for the individual channels, as taught by Meyers, for the purpose of providing each sensor array with a different field of view.

Regarding claim 4, Miyatake discloses everything claimed as applied above (see claim 1), however Miyatake fails to disclose wherein the individual microlenses differ with respect to decentralization relative to the detector, a focal distance, conical and/or aspherical parameters and hence enable different inclinations of the optical axes. However, the examiner maintains that it was well known in the art to provide wherein the individual microlenses differ with respect to decentralization relative to the detector, a focal distance, conical and/or aspherical parameters and hence enable different inclinations of the optical axes, as taught by Meyers.

In a similar field of endeavor Meyers discloses a compact image capture device. In addition Meyers discloses lenslets (212) which have different aspherical parameters as disclosed in figure 6.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miyatake by specifically providing wherein the individual microlenses differ with respect to decentralization relative to the detector, a focal distance, conical and/or aspherical parameters and hence enable different inclinations of the optical axes, as taught by Meyers, for the purpose of allowing each photosensitive site to view a different segment of a scene.

Regarding claim 9, Miyatake discloses everything claimed as applied above (see claim 1), however Miyatake fails to disclose wherein the individual optical channels have at least one of: (i) different pitch differences between the microlens and the detector; and (ii) at least one pinhole for correction of distortion. However, the examiner maintains that it was well known in the art to provide wherein the individual optical channels have at least one of: (i) different pitch differences between the microlens and the detector; and (ii) at least one pinhole for correction of distortion, as taught by Meyers.

In a similar field of endeavor Meyers discloses a compact image capture device. In addition Meyers discloses that in order to see different fields of view the optical axis (214) of the lenslets (212) are located at a distance which becomes progressively larger than the center-to-center distance of the pixels in the array, as disclosed at column 5, lines 55-58, and exhibited in figure 5.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miyatake by specifically providing wherein the individual optical channels have at least one of: (i) different pitch differences between the microlens and the detector; and (ii) at least one pinhole for correction of distortion, as taught by Meyers, for the purpose of allowing each photosensitive site to view a different segment of a scene.

Regarding claim 10, Miyatake discloses everything claimed as applied above (see claim 1), however Miyatake fails to disclose wherein the image recognition system has a constructional length of less than 1mm. However, the examiner maintains that it

was well known in the art to provide wherein the image recognition system has a constructional length of less than 1mm, as taught by Meyers.

In a similar field of endeavor Meyers discloses a compact image capture device. In addition Meyers discloses a lenslet having a focal length of 0.5 mm, which reads on "wherein the image recognition system has a constructional length of less than 1mm", as disclosed at column 7, line 51.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miyatake by specifically providing wherein the image recognition system has a constructional length of less than 1mm, as taught by Meyers, for the purpose reducing material costs.

Regarding claim 17, Miyatake discloses everything claimed as applied above (see claim 1), however Miyatake fails to disclose wherein the detectors are present as at least one of: (i) a CCD, (ii) a CMOS photosensor array, and (iii) a photosensor array comprising a polymer. However, the examiner maintains that it was well known in the art to provide wherein the detectors are present as at least one of: (i) a CCD, (ii) a CMOS photosensor array, and (iii) a photosensor array comprising a polymer, as taught by Meyers.

In a similar field of endeavor Meyers discloses a compact image capture device. In addition Meyers discloses that unit pixel may be a CCD device as disclosed at column 3 lines 21-22.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miyatake by specifically providing wherein the

detectors are present as at least one of: (i) a CCD, (ii) a CMOS photosensor array, and (iii) a photosensor array comprising a polymer, as taught by Meyers, for the purpose of using the device to capture an image.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyatake in view of Beeson et al. (United States Patent 5,521,725), hereinafter referenced as Beeson.

Regarding claim 5, Miyatake discloses everything claimed as applied above (see claim 1), however Miyatake fails to disclose wherein microprisms which enable different inclinations of the optical axes are integrated in the individual microlenses. However, the examiner maintains that it was well known in the art to provide wherein microprisms which enable different inclinations of the optical axes are integrated in the individual microlenses, as taught by Beeson.

In a similar field of endeavor Beeson discloses an illumination system employing an array or microprisms. In addition Beeson discloses that light emanating from each microprism (28) is directed to a corresponding microlens (80), which reads on "microprisms which enable different inclinations of the optical axes are integrated in the individual microlenses", as disclosed at column 2, lines 53-55 and exhibited in figure 2.

Therefore, it would have been obvious to one of ordinary skill in the art at microprisms which enable different inclinations of the optical axes are integrated in the individual microlenses, as taught by Beeson, for the purpose of creating spatially directing light.

Claims 6, 7, 20, 22, and 23, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyatake in view of Applicant's Admitted Prior Art, hereinafter referenced as AAPA.

Regarding claim 6, Miyatake discloses everything claimed as applied above (see claim 1), however Miyatake fails to disclose wherein the individual microlenses are disposed on a base which has a convex or concave configuration and hence enable different inclinations of the optical axes. However, the examiner maintains that it was well known in the art to provide wherein the individual microlenses are disposed on a base which has a convex or concave configuration and hence enable different inclinations of the optical axes, as taught by AAPA.

In a similar field of endeavor AAPA discloses an artificial compound eye using a microlens array and its application to scale-invariant processing. In addition, AAPA discloses microlenses in a convex configuration as shown in Figure 1 of the article "an artificial compound eye using a microlens array and its application to scale-invariant processing".

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miyatake by specifically providing wherein the individual microlenses are disposed on a base which has a convex or concave configuration and hence enable different inclinations of the optical axes, as taught by AAPA, for the purpose of creating an artificial eye.

Regarding claim 7, Miyatake discloses everything claimed as applied above (see claim 1), however Miyatake fails to disclose wherein the detectors are disposed on a

base which has a convex or concave configuration. However, the examiner maintains that it was well known in the art to provide wherein the detectors are disposed on a base which has a convex or concave configuration, as taught by AAPA.

In a similar field of endeavor AAPA discloses an artificial compound eye using a microlens array and its application to scale-invariant processing. In addition, AAPA discloses reception cells in a convex configuration, which reads on "wherein the detectors are disposed on a base which has a convex or concave configuration", as shown in Figure 1 of the article "an artificial compound eye using a microlens array and its application to scale-invariant processing".

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miyatake by specifically providing wherein the detectors are disposed on a base which has a convex or concave configuration, as taught by AAPA, for the purpose of creating an artificial eye.

Regarding claim 20, Miyatake discloses everything claimed as applied above (see claim 1), however Miyatake fails to disclose wherein pinhole diaphragms are disposed behind the microlenses and directly in front of the detectors and are positioned such that at least one pinhole diaphragm is assigned to each microlens. However, the examiner maintains that it was well known in the art to provide wherein pinhole diaphragms are disposed behind the microlenses and directly in front of the detectors and are positioned such that at least one pinhole diaphragm is assigned to each microlens, as taught by AAPA.

In a similar field of endeavor AAPA discloses an optical sensor array in an artificial compound eye. In addition AAPA discloses the optical sensor consists of a microlens, a pinhole, and a photodetector, which reads on " wherein pinhole diaphragms are disposed behind the microlenses and directly in front of the detectors and are positioned such that at least one pinhole diaphragm is assigned to each microlens", as disclosed in Section 2 of the article "Optical sensor array in an artificial compound eye".

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miyatake by specifically providing wherein pinhole diaphragms are disposed behind the microlenses and directly in front of the detectors and are positioned such that at least one pinhole diaphragm is assigned to each microlens, as taught by AAPA, for the purpose of creating an artificial compound eye.

Regarding claim 22, Miyatake discloses everything claimed as applied above (see claim 20), however Miyatake fails to disclose wherein the pinhole diaphragms have a diameter in the range of about 1 to 10 microns. However, the examiner maintains that it was well known in the art to provide wherein the pinhole diaphragms have a diameter in the range of about 1 to 10 microns, as taught by AAPA.

In a similar field of endeavor AAPA discloses an optical sensor array in an artificial compound eye. In addition AAPA discloses a pinhole diameter of 1.33 microns as shown in Figure 4b of the article "Optical sensor array in an artificial compound eye".

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miyatake by specifically providing wherein the pinhole diaphragms have a diameter in the range of about 1 to 10 microns, as taught by AAPA, for the purpose of creating an artificial compound eye.

Regarding claim 23, Miyatake discloses everything claimed as applied above (see claim 20), however Miyatake fails to disclose wherein the pinhole diaphragm is produced from a metal or polymer coating or combinations thereof. However, the examiner maintains that it was well known in the art to provide wherein the pinhole diaphragm is produced from a metal or polymer coating or combinations thereof, as taught by AAPA.

In a similar field of endeavor AAPA discloses an optical sensor array in an artificial compound eye. In addition AAPA discloses that the pinhole array is fabricated using chromium as disclosed in section 4.2 of the article "Optical sensor array in an artificial compound eye".

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miyatake by specifically providing wherein the pinhole diaphragm is produced from a metal or polymer coating or combinations thereof, as taught by AAPA, for the purpose of creating an artificial compound eye.

Regarding claim 26, Miyatake discloses everything claimed as applied above (see claim 20), however Miyatake fails to disclose wherein a pixel is assigned to each optical channel. However, the examiner maintains that it was well known in the art to provide wherein a pixel is assigned to each optical channel, as taught by AAPA.

In a similar field of endeavor AAPA discloses an optical sensor array in an artificial compound eye. In addition AAPA discloses that each micro lens is in series with a single photodetector, which reads on “wherein a pixel is assigned to each optical channel”, as disclosed in section 2 of the article "Optical sensor array in an artificial compound eye".

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miyatake by specifically providing wherein a pixel is assigned to each optical channel, as taught by AAPA, for the purpose of maximizing the amount of light captured from each microlens.

Claims 14 are 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyatake in view of Takayama (United States Patent Application Publication 2005/0041134), hereinafter referenced as Takayama.

Regarding claim 14, Miyatake discloses everything claimed as applied above (see claim 1), however, Miyatake fails to disclose wherein the positions of the microlens and of the detectors are precisely defined lithographically. However, the examiner maintains that it was well known in the art to provide wherein the positions of the microlens and of the detectors are precisely defined lithographically, as taught by Takayama.

In a similar field of endeavor Takayama discloses a solid-state imaging device. In addition Takayama discloses wherein the protrusion portions are formed to be integrated with the micro-lens array solidly in one process, as disclosed at paragraph 31, lines 3-5, he further discloses that this process is conducted by a lithography

technique as disclosed at paragraph 32, lines 3-4. The protrusions define the position of the micro-lens and the detectors; therefore the above text reads on "wherein the positions of the microlens and of the detectors are precisely defined lithographically".

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miyatake by specifically providing wherein the positions of the microlens and of the detectors are precisely defined lithographically, as taught by Takayama, for the purpose of keeping manufacturing costs low.

Regarding claim 16, Miyatake discloses everything claimed as applied above (see claim 1), however, Miyatake fails to disclose wherein the optical isolation if effected by lithographically produced separating walls. However, the examiner maintains that it was well known in the art to provide wherein the optical isolation if effected by lithographically produced separating walls, as taught by Takayama.

In a similar field of endeavor Takayama discloses wherein the protrusion portions are formed to be integrated with the micro-lens array solidly in one process, as disclosed at paragraph 31, lines 3-5, he further discloses that this process is conducted by a lithography technique, which reads on "wherein the optical isolation if effected by lithographically produced separating walls", as disclosed at paragraph 32, lines 3-4.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miyatake by specifically providing wherein the optical isolation if effected by lithographically produced separating walls, as taught by Takayama, for the purpose of keeping manufacturing costs low.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyatake in view of Ogata et al. (United States Patent Application Publication 2003/0214898), hereinafter referenced as Ogata.

Regarding claim 14, Ogata discloses everything claimed as applied above (see claim 1), however, Ogata fails to disclose wherein at least a part of the lens in anamorphic. However, the examiner maintains that it was well known in the art to provide wherein at least a part of the lens in anamorphic, as taught by Ogata.

In a similar field of endeavor Ogata discloses an image pickup device. In addition, Ogata discloses that in each of the preferred embodiments it is possible to use the anamorphic lens for the microlens, which reads on "wherein at least a part of the lens in anamorphic", as disclosed at paragraph 928, lines 1-2.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miyatake by specifically providing wherein at least a part of the lens in anamorphic, as taught by Ogata, for the purpose of providing a larger field of view with a lens that is roughly the same physical size.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyatake in view Nagaoka et al. (United States Patent Application Publication 2004/0218283), hereinafter referenced as Nagaoka.

Regarding claim 24, Miyatake discloses everything claimed as applied above (see claim 1), however, Miyatake fails to disclose wherein the image recognition system has a liquid lens which is pre-connected between image and microlenses in order to adjust the field of view. However, the examiner maintains that it was well known in the

art to provide wherein the image recognition system has a liquid lens which is pre-connected between image and microlenses in order to adjust the field of view, as taught by Nagaoka.

In a similar field of endeavor Nagaoka discloses an image capturing device. In addition, Nagaoka discloses optical element (10) which is placed in front of image capturing element (41), as disclosed at paragraph 210, line 3 and exhibited in figure 14. The optical element of the invention is disclosed to comprise of a first liquid member as disclosed at paragraph 7, lines 1-2. The above disclosures read on "wherein the image recognition system has a liquid lens which is pre-connected between image and microlenses in order to adjust the field of view".

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miyatake by specifically providing wherein the image recognition system has a liquid lens which is pre-connected between image and microlenses in order to adjust the field of view, as taught by Nagaoka, for the purpose of providing zoom magnification while minimizing the number of mechanical parts.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyatake in view of Campbell et al. (United States Patent 7,196,728), hereinafter referenced as Campbell.

Regarding claim 25, Miyatake discloses everything claimed as applied above (see claim 1), however, Miyatake fails to disclose wherein light sources are disposed on or between the optical channels. However, the examiner maintains that it was well

known in the art to provide wherein light sources are disposed on or between the optical channels, as taught by Campbell.

In a similar field of endeavor Campbell discloses an apparatus for displaying images in combination with taking images. In addition Campbell discloses a camera means (14) distributed throughout the display means (12), which reads on "wherein light sources are disposed on or between the optical channels", as disclosed at column 2, lines 24-25 and exhibited in figure 1.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miyatake by specifically providing wherein the positions of the microlens and of the detectors are precisely defined lithographically, as taught by Campbell, for the purpose of creating a electronic window in which a person can stand on either side of the apparatus and see what is on the other side.

Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyatake in view of Tangen et al. (United States Patent 6,765,617), hereinafter referenced as Tangen.

Regarding claim 31, Miyatake discloses everything claimed as applied above (see claim 27), in addition Miyatake discloses a plurality of pixels per optical channel is disposed (see claim 27). However Miyatake fails to disclose that the optical axes of at least two optical channels intersect in one object spot in order to enable a stereoscopic 3D photograph and/or a distance measurement. However, the examiner maintains that it was well known in the art to provide disclose that the optical axes of at least two

optical channels intersect in one object spot in order to enable a stereoscopic 3D photograph and/or a distance measurement, as taught by Tangen.

In a similar field of endeavor Tangen discloses an optoelectronic camera. In addition Tangen discloses that parallax is present in his camera, , which uses microlenses (L) figure 2, which reads on "the optical axes of at least two optical channels intersect in one object spot in order to enable a stereoscopic 3D photograph and/or a distance measurement", as disclosed at column 14 lines 40-43.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miyatake by specifically providing that the optical axes of at least two optical channels intersect in one object spot in order to enable a stereoscopic 3D photograph and/or a distance measurement, as taught by Tangen, for the purpose of measuring the distance of an object.

Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyatake in view of Sasano et al. (United States Patent 5,466,926), hereinafter referenced as Sasano.

Regarding claim 32, Miyatake discloses everything claimed as applied above (see claim 27), however Miyatake fails to disclose wherein dispersive elements for colour photos are disposed in front of or on the microlenses. However, the examiner maintains that it was well known in the art to provide wherein dispersive elements for colour photos are disposed in front of or on the microlenses, as taught by Sasano.

In a similar field of endeavor Sasano discloses colored microlens array. In addition Sasano discloses colored microlenses 31, 32, and 33, which read on "wherein

dispersive elements for colour photos are disposed in front of or on the microlenses", as disclosed at column 6, line 42 and exhibited in figure 2A.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miyatake by specifically providing wherein dispersive elements for colour photos are disposed in front of or on the microlenses, as taught by Sasano, for the purpose of capturing color images.

Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyatake in view of Crosby (United States Patent Application Publication 2004/0201890), hereinafter referenced as Crosby.

Regarding claim 33, Miyatake discloses everything claimed as applied above (see claim 27), however Miyatake fails to disclose wherein differently orientated gratings or structured polarization filters are disposed in front of similar pixels of an optical channel in order to adjust the polarization sensitivity. However, the examiner maintains that it was well known in the art to provide wherein differently orientated gratings or structured polarization filters are disposed in front of similar pixels of an optical channel in order to adjust the polarization sensitivity, as taught by Crosby.

In a similar field of endeavor Crosby discloses a microlens including wire-grid polarizer. In addition Crosby discloses wire-grid polarizers (16 and 18) on top of microlens (12), which reads on "wherein differently orientated gratings or structured polarization filters are disposed in front of similar pixels of an optical channel in order to adjust the polarization sensitivity", as disclosed at paragraph 13, line 1 and exhibited in figure 2.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miyatake by specifically providing wherein differently orientated gratings or structured polarization filters are disposed in front of similar pixels of an optical channel in order to adjust the polarization sensitivity, as taught by Crosby, for the purpose of maintaining polarization of light.

Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyatake in view of Mizuguchi et al. (United States Patent 5,543,942), hereinafter referenced as Mizuguchi.

Regarding claim 34, Miyatake discloses everything claimed as applied above (see claim 27), however Miyatake fails to disclose wherein the image recognition system is combined with at least one liquid crystal element. However, the examiner maintains that it was well known in the art to provide wherein the image recognition system is combined with at least one liquid crystal element, as taught by Mizuguchi.

In a similar field of endeavor Mizuguchi discloses an LCD microlens substrate. In addition Mizuguchi discloses liquid crystal layer (6) and lens sections (2), which read on "wherein the image recognition system is combined with at least one liquid crystal element", as disclosed at column 6, lines 12 and 23 and exhibited in figure 1.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miyatake by specifically providing wherein the image recognition system is combined with at least one liquid crystal element, as taught by Mizuguchi, for the purpose of providing a liquid crystal display element.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JASON FLOHRE whose telephone number is (571)270-7238. The examiner can normally be reached on Monday to Thursday 8:00 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffery Harold can be reached on 571-272-7519. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JAF/

/Tse Chen/
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